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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/693,880

10/28/2003

Chidane Ouchi

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7590

10/20/2004

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

LYONS, MICHAEL A

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/693,880

Applicant(s)

OUCHI, CHIDANE

Examiner

Michael A. Lyons

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/28/03
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☒ Certified copies of the priority documents have been received in Application No. 09/893,636.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

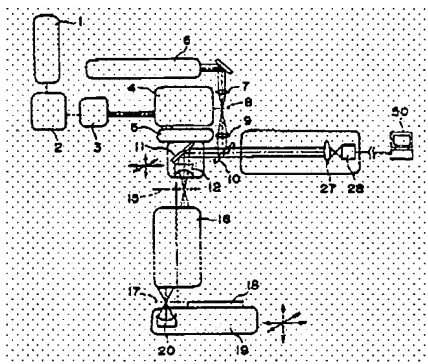
- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 102803.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murakami et al (6,633,362).



Regarding claim 21, Murakami (Fig. 1) discloses an exposure apparatus featuring a projection optical system 16 for projecting the pattern of reticle 15 illuminated by illumination optical system 4 onto a wafer held by wafer chuck 18, and an interferometer for measuring an optical characteristic of the projection optical system featuring laser 6 and a pinhole 8 through which the laser light passes before passing through the projection optical system.

Murakami, however, fails to disclose the diameter of the pinhole to be smaller than the diameter of an Airy disc.

In the disclosure, Murakami does relate the size of the pinhole to an Airy disc, disclosing that the pinhole diameter is set to approximately the same size as an Airy disc. This size, however, still generates “a substantially idealistically spherical wave” out of the light passing through the pinhole (Col. 3, lines 18-22). This spherical wave is the same goal of the use of the pinhole in the instant application.

Therefore, it would have been an obvious matter of design choice to make the pinhole diameter of Murakami to be smaller than the diameter of an Airy disc, since such a modification would have involved a mere change in the size of a component (and in this case, generating identical results). A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

As for claim 22, the same argument as above with regards to the size of the pinhole holds here.

As for claim 23, the interferometer measures the wavefront aberration of the projection optical system (Col. 3, lines 43-52).

As for claim 24, the interferometer is a Fizeau interferometer (see figure).

Regarding claim 25, Murakami (Fig. 1) discloses an exposure apparatus featuring a projection optical system 16 for projecting the pattern of reticle 15 illuminated by illumination optical system 4 onto a wafer held by wafer chuck 18, and an interferometer for measuring an optical characteristic of the projection optical system featuring laser 6 and a pinhole 8 through which the laser light passes before passing through the projection optical system, along with a CCD 28 as a photosensitive element for detecting the interference light generated by the system.

Murakami, however, fails to disclose the diameter of the pinhole to be smaller than the diameter of an Airy disc.

In the disclosure, Murakami does relate the size of the pinhole to an Airy disc, disclosing that the pinhole diameter is set to approximately the same size as an Airy disc. This size, however, still generates “a substantially idealistically spherical wave” out of the light passing through the pinhole (Col. 3, lines 18-22). This spherical wave is the same goal of the use of the pinhole in the instant application.

Therefore, it would have been an obvious matter of design choice to make the pinhole diameter of Murakami to be smaller than the diameter of an Airy disc, since such a modification would have involved a mere change in the size of a component (and in this case, generating identical results). A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Regarding claim 26, Murakami discloses the apparatus for exposing a substrate using laser 1, beam shaping optical system 2, incoherency transforming unit 3, illumination optical system 4, reticle 15, projection optical system 16, image point 17, and a substrate carried on wafer chuck 18, in addition to the remainder of the exposure apparatus disclosed above with regards to claim 21. The method of using the device, including developing the exposed substrate through the exposure process, flows from the natural use of the Murakami apparatus.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Pat. 6,456,382, an interferometer that measures aspherical surfaces to Ichihara et al., and US Pat. 6,614,535, an exposure apparatus with interferometer to Kakuchi et al.

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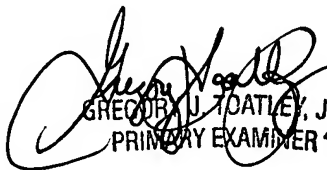
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 571-272-2420.

The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MAL
October 14, 2004


GREGORY J. TOATLEY, JR.
PRIMARY EXAMINER SE 2877